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A Crisis in the History of Central Park.

THE Central Park of New York is one of the most interesting creations of American genius. No other city in the world has within its borders a work of landscape-art which equals it in originality of conception, in simplicity and beauty. It is worthy of the noblest civic pride, and it especially deserves affection and jealous care, because no other public work of the city approaches it in dignity or value. If New York is to have a great Exposition in 1892, nothing in the display could be more attractive to visitors than this park arrayed in all its summer loveliness. Nothing more distinctively or characteristically American can be imagined than the upper portion of the park, where the broad, free sweep of hill and valley permitted a more natural treatment of the original features of the land than was possible among the frequent narrow ridges of rock in the portion south of the reservoir. The gently undulating meadows, with their perfect turf; the projecting point of rock, with its clustering Pin Oaks; the recesses in the wood border, where the limits of the greensward are lost in shadows; the sense of mystery and spaciousness which is given by the skillfully broken line of foliage which encircles the whole; the natural forest which sweeps up the long slope toward the northern boundary: all these constitute a picture of pastoral rest and peace which has no rival in the heart of a great city.

It is this most delightful portion of the park, and as much more of it as they may consider necessary, which the Committee on Sites have voted to cover up with carpentry. Even if it were probable that the wounds thus made could be healed within a reasonable period, this would mean the obliteration of the most beautiful bit of scenery on Manhattan Island at precisely the time when all the world is invited here, and it would advertise the vandalism of a city which failed to appreciate its noblest possession. But the hope that only temporary damage would be inflicted by such an invasion is a delusion. There can be no difference of opinion among persons familiar with park work as to the probable extent of injury to the park, if the proposed buildings, with their necessary approaches and surroundings, are placed on the North Meadows. Not one of them will dissent from the view of Mr. Olmsted, who writes:

"I am positive that no such structure could be provided for without involving a devastation that could never be repaired. I do not believe that it could be done without an enormous waste of the value of the park for the purposes to which it has been dedicated, and for which it has been prepared at great outlay." But we are not left to conjecture in this matter. Mr. Russell Thayer, who was Chief Engineer and Superintendent of Fairmount Park at the time of the Centennial Exposition, has written these words of warning, which are of singular value, because they are a record of actual experience:

In my opinion, it is impossible to erect the large structures required without destroying great numbers of the finest trees in the park, and, at the same time, doing almost irretrievable damage to the present shape of the grounds. Foundations will be required for all the structures, which will completely alter the present contour of a great portion of the present beautiful surface of the park and make it almost impossible ever to restore it to its present condition. The greater portion of the drainage system of the park would, of course, be destroyed, and, in many places, it would be necessary to level off the small hills and fill in the valleys in order to provide proper grades for the floors of the larger buildings. Besides the destruction of the greater portion of the trees, which would unavoidably interfere with the proper laying out of the buildings of the Exhibition, most of the shrubbery in the portion of the park devoted to the object would necessarily be destroyed. In fact, it may be stated that the greater portion of Central Park would be so changed after this Exhibition had been held therein that it would not be recognized as a public park. . . . The section of Fairmount Park occupied by the Centennial Exhibition was, previous to that event, almost totally unimproved, the greater portion being merely farm-lands. And even there, after the removal of the hundreds of buildings which composd the Exhibition, the grounds were a perfect desert of clay and gravel, upon which not a blade of grass could be made to grow for several years. Therefore, I am obliged to state as my candid opinion that, if the Exhibition is held in a highly cultivated park like the Central Park, the damage thereto will be almost incalculable.

The park is still young, but it has taken thirty years to grow into the beauty which now invests it, and a generation would be needed to restore it after the Exposition converted it into a desert. Oaks and Hickories, Chestnuts and Beeches, like those which were growing in the natural wood before the park was planned, can be replaced only after years of patient waiting. But what ground is there for hope that any resolute effort would be made to restore the park. If there is not enough public spirit in the city to preserve it now, when in the prime and freshness of its beauty, what encouragement would there be to begin over again, with the very surface of the ground scarified and blasted, until not one of its original features could be recognized? Even if any attempt at restoration were made it would soon be abandoned for some new invasion, because the clamor for space to be used for one purpose or another will grow louder as the population becomes more dense. The probabilities are that if the park is thrown open to this celebration, it will be left an entirely different and inferior work, and that its most impressive landscape features will be obliterated forever.

We cannot believe that the city is to suffer such a wanton spoliation, or that the park is doomed to ruin long before it has attained its mature beauty or has approached the full measure of its usefulness. When the intelligence and public spirit of New York have been appealed to on capital occasions, they have never failed to repel any assault that threatened the park with serious injury. They have erected barriers of precedent all around it against every form of destructive intrusion, and, foreseeing that these barriers might be prostrated before some sudden gust of passion or of enthusiasm, they have deliberately enacted a law to meet such emergencies. Beyond all doubt the present dangers to Central Park are more grave than any it has heretofore encountered. Its very existence as a park is in jeopardy. But the people of the city can be trusted to redeem their solemn obligations to hand down this peerless pleasure-ground without impairment to posterity.

Drives and Walks.—IV.

IT has been said that it is far better that no approach or other drive should cross the lawn in front of a country house. But, of course, the arrangement which is ideally best cannot always be made. In many cases where the road can be kept away from the immediate vicinity of the house-front, it will have to pass it at a greater distance. The road may then be masked by low plantations, which will, at least, be less disagreeable to the eye than the line of gravel. But plantations will often be undesirable as obstructions in what ought to be a simple extended view, or a broadly treated landscape. It is better, when possible, to sink the road, or to raise the lawn in a gentle slope towards it to such a degree that the eye will not perceive it, so that the stretches of lawn on its hither and further sides will seem to unite without a break.

If the place is so large that the house is not seen until after one has entered the approach-road, attention should be paid to the first view thus afforded. There is much in initial impressions, and a house may never redeem itself wholly in a visitor's eyes if it fails to do itself justice when they first light upon it.

With regard to walks, the same general principles hold as with regard to drives. There should be no more of them than are needful; they should neither be so straight as to lack beauty, nor so meandering as to lack ordinary directness and they should be as narrow as convenience will permit, for gravel streaks are not charming objects in themselves, and the greater their breadth the more they decrease the apparent size of the place. They should not be so narrow that two persons cannot pass with comfort, except in retired situations, where pedestrians will certainly be few; but anything in excess of this should be studiously avoided. A walk six feet wide, where one of three would have sufficed, will dwarf its surroundings to a much greater degree than most owners realize.

A lawn can be injured almost as much by foot-paths as by drives when they cut across it. A properly kept lawn is as delightful to walk upon as to look at, and, in our dry summers, the days are few when it will be too wet even for a lady's shoe. Of course, there may be cases when some distant object—a summer-house that is constantly used, a boat-house or tennis-court—will so constantly attract the feet that, unless a walk be provided, a ragged path will be worn across the grass. Then, a made walk is naturally better, for anything is better than a look of untidiness and neglect in grounds which ought to be carefully kept. But it should, if possible, be carried around the lawn, and, if this is not possible, its presence should be accepted as a disagreeable necessity.

Paths should never be made across a lawn, simply to give access to flower-beds, for the flower-beds themselves have no business there. A lawn is a place for grass. Its object, whether it be large or small, is to afford a simple sheet of verdure to delight the eye with its reposeful breadth and to supply a proper foreground for the plantations beyond it. To spot bright beds about is to ruin its peacefulness and its unity. There are thousands of country-places in America, from large estates to suburban villas, which would be immeasurably improved could all the flower-beds on the lawn, all the fountains and vases, and all the paths—leading nowhere but back to the house again—be once and for all turfed over. Flowers can usually be introduced in sufficient quantities in other ways—scattered among the shrubberies or arranged in massed beds behind the house or in borders disassociated from the lawn. Or, if they are the prime consideration and the place is not large enough for a lawn and a flower-garden both, it is better to give up the lawn altogether and arrange in front of the house an old-fashioned garden with as many beds and walks and Box-hedges as the space will allow. Such a design is consistent and sensible and may be made very pretty, while the more common device of trying to unite a lawn and a flower-garden is illogical and can never result in anything but an artistic monstrosity.

If there is a lawn, large or small, care should be taken that no walk, as well as no drive, runs between it and the house. Let the grass come up to the house-foundations, and unite the two by planting a few vines and shrubs. Then the house and its site will be connected and harmonized; the walls will seem to spring from the soil almost like a natural growth, and the picture seen from the lawn will be as charming as that which the lawn presents when seen from the house. Whether there are mere door-steps, or a porch, or a piazza, no path is needed, for this entrance should be used only by those who wish to stroll upon the lawn or to cross it to some spot not otherwise accessible. And even on those sides of the house where a path is needed it should not be allowed to run close to the walls. Sufficient space should be reserved for planting against the walls, and thus, if the further side of the path is properly planted too, from a little distance the eye will see only the masses of verdure which connect the house with the landscape about it.

Although curving roads and walks are best in a place of any size, straight ones should usually be preferred in a small villa-lot. Then every inch of space is valuable, and, of course, a straight path occupies less ground than a winding one. The straight lines formed by the house and the street cannot be for a moment forgotten, and it is, therefore, good art to accept them as the basis of the whole scheme and make the paths within the gates correspond with them. Then, too, there should be no drive at all unless there be a stable behind the house. In this case it is best to leave the front free and carry the road in at the end of the lot to a door in the side of the house whence it may continue to the stable-yard. Place for a lawn is thus reserved in front, and the line of gravel will be least conspicuous from the principal windows. But it is better, when there is no stable, to sacrifice comfort a little in the interests of beauty—to leave the carriage in the street and let but a narrow pathway approach the house. The sacrifice will be a small one, and the gain in the aspect of the place as a whole may easily be great.

The suggestions in these chapters have not been made with the idea of making "every man his own landscape-gardener." On the contrary, they have been written to show how many things must be considered in the building of the simplest country-house, or the designing of the smallest place; and how desirable it is, therefore, that the aid of an artist should be called in at the outset.

Native Shrubs of California—II.

Cercocarpus betuloides, Nutt. (Low & Gray, Fl. i. 427), bears some likeness to the shrubby birches, but has sparser foliage, and, consequently, little beauty to recommend it. This prevailing shrub or small tree of the Coast mountains of the Pacific states is, however, of much botanical interest and possibly of considerable economic value. Known to the mountaineers and miners by the name of Wild Mahogany, its wood is the heaviest and hardiest we have; and the leafy twigs have a sweet birchy flavor, rendering them choice food for cattle in late summer and autumn when the annual grass-crop has failed.

Under the name of *C. parvifolius*, with which species it has been confounded by those botanists who have seen dried twigs only, this shrub is credited with a range in California from San Diego to Lake County, or through the southern and middle parts of the State; but it is equally common southward on the Lower Californian peninsula, and northward on the Siskiyou Mountains in Oregon. That it is a good species, better than Nuttall the author of both of them knew, I indicated some years since, in my paper on Santa Cruz Island.* The larger, proportionally broader and nearly glabrous leaves, on which characters Nuttall seems to have relied, are indeed insufficient; they are inconstant. Small-leaved states of *C. betuloides* are often met with; but, over and above a certain constant difference in the general bearing or habit, easily seen at a glance, but not easily defined, the stem and bark of the two are strikingly unlike. *C. parvifolius*, which, by the way, occupies an entirely different region of country, *i. e.* the Rocky Mountains and adjacent interior districts, not reaching any part of California or Oregon, has a dark-colored, thick, persistent and fissured bark. *C. betuloides*, on the other hand, often much larger every way than the best developed states of *C. parvifolius*, presents, at most seasons of the year, a clean, smooth trunk with gray bark, and this outer bark is deciduous, falling away in irregular flakes in early autumn. On this character alone, *C. betuloides* will rest securely as an excellent species. By the pioneer collector, Mr. Douglas, and by the authors of the Botany of Captain Beechey's Voyage, the small-leaved state of *C. betuliodes* was mistaken for the real *C. parvifolius*, and thus began that confusion of the two species which has continued, in our books, to the present.

During my vacation journeyings of the past summer, I, for the first time met with the curious *Fremontia Californica* (Low, Plantæ Fremontianæ, p. 6. t. ii) in its native wilderness. Particularly attractive to all botanists as being nearly related to the celebrated Hand Flower Tree of southern Mexico, eminent systematists considering it as nothing more than a second species of *Cheiranthodendron*, I had not, from the numerous herbarium specimens I had seen, inferred its highly ornamental character. The foliage, as in most shrubs of our arid mountain districts,

* Bulletin Calif. Acad. ii., 356.

is sparse and small. When the Rev. Mr. Fitch, the first after General Fremont to observe the shrub, described it to Dr. Torrey as having very much the appearance of an ordinary Fig-tree, he must have had in view the mere outline and texture of the leaves. In these points only are the leaves like fig-leaves; for they are commonly only an inch in diameter, and rusty tomentose beneath. The bark of both main stem and branches is, indeed, smooth and much like that of the Fig-tree, but darker, even blackish on the older trunks. But the beauty of the Fremontia is in the crowded profusion of its red and yellow Hibiscus-like flowers. Each wand-like branch, at flowering time, is simply a long, solid wreath of bright yellow, tinged with a rusty red; and the arrangement of the branches—the head of the tree—is as far from the conventional as the structure of the flower is unique. Growing along the steep and jagged rocky slopes of the mountains, the dark, smooth trunk will rise erect, while all the long-flowering branches, not rarely six or eight feet long, will hang on one side, it may be; or they may spread out in several directions, forming a flat-topped, or umbrella-like body; but the bush or small tree, not rarely twelve feet in height, is always attractive if in bloom and the flowering season is not brief. Or rather, the showy corolla-like calyces, of great firmness of texture, remain fresh a long time, and finally wither, almost without change of color, and remain attached to the growing fruit for some weeks.

Attaining its best development among the arid hills which shut in such almost rainless and overheated regions as the Mohave Desert, it is not likely that the Fremontia could be made well at home in gardens even in the milder regions of the east. In its more northerly habitat, the upper Sacramento valley in California, it is smaller and less beautiful by far than under the comparatively rainless skies of the southern interior. But any lover of shrubs, at once odd and beautiful, having once enjoyed the sight of this one in flower, will wish he might add it to the ornaments of home.

University of California. *Edward L. Greene.*

Notes Upon Some North American Trees.—XII.

254. Quercus obtusiloba, Michx.—A much older name than that of Michaux (1801) for this tree is that of Wangenheim (Amer. 78, t. 6., f. 15, 1789).—*Q. stellata*; but Marshall's *Q. alba minor* (1785) is older still, and if such names of Marshall's as *Juglans minima* and *Juglans odorata* are to be taken up there seems no escape from *Quercus minor* as there can be no doubt of the identity of the species to which he applied this name.

The variety of this species with almost entire or undulate somewhat angled thin leaves is common on the sandy west coast of Florida, reaching at least as far south as Tampa, where it grows into a tree twenty to thirty feet high. The oldest name for this plant appears to be *Q. parvifolia* of Chapman; so that it would become if it is considered a variety of the Post-Oak, with which it is connected by intermediate forms, var. *parvifolia*.

255. Quercus undulata var., Gambellii, Engelm.—This is the common deciduous-leaved White Oak found in the mountain cañons from western Texas to southern New Mexico and Arizona, northern Mexico, Colorado and Utah. It is very closely related to the eastern *Quercus alba*; and Mr. Edward L. Greene, whose opportunities for studying this tree in the field have been great, insists (West American Oaks, 23,) that it cannot be considered a form of the shrubby evergreen *Q. undulata*, with which it was united by Engelmann. Forms occur, or appear to occur, in the herbarium which seem to lead to a union more or less close of all the Oaks of the interior of the continent; but with Oaks, and indeed, with nearly all trees, a judgment of specific differences and limitations based primarily on studies in the field is the best, and in this case I am glad to have impressions gathered from an examination of dried specimens only, confirmed by Mr. Greene's field observations, and I shall follow him in restoring the *Quercus Gambelii* of Nuttall.

263. Quercus oblongifolia, Torr.—Mr. Greene proposes (*l. c.*) to separate from this New Mexico and Arizona tree the evergreen White Oak of southern California, under the name of *Quercus Engelmanni*. The California tree is larger, with larger leaves, often retuse or emarginate, larger striate acorns and much thicker cup-scales; and in the herbarium it is not difficult to distinguish the two plants, which it will be best, probably, to keep separate. It is less evident, however, that Mr. Greene's proposition (*l. c. 29*) that *Q. grisea*, Liebm., is a variety of *Q. undulata*, Torr., to which he would refer also Torrey's *Q. oblongifolia*, can be sustained. The connate cotyledons of *Q. grisea* would seem to separate this from the other Rocky Mountain and north Mexican White Oaks; although *Q. oblongifolia* may well be an arborescent form of the polymorphous and generally shrubby *Q. undulata*. But these are matters which cannot be settled at this time and which only protracted field observations can determine satisfactorily.

267. Quercus virens, Ait.—Aiton's name (Hort. Kew, iii., 356), published in 1789, must give way to Miller's older one (Gardeners' Dictionary, ed. 8.), published in 1768—*Quercus Virginiana*.

Quercus tomentilla.—This evergreen White Oak is closely related to *Q. chrysolepis*, from which it is readily distinguished by the stellate pubescence of the young shoots and foliage and by the prominent primary veins of the leaves. It was discovered by Dr. Edward Palmer in 1875, on the Island of Guadaloupe off the coast of Lower California, and has recently been found by Mr. Greene on the Island of Santa Cruz, and last year by Mr. Brandigee on Santa Rosa: and it must now be included in the North American Silva. Its position is immediately after *Q. chrysolepis*.

Quercus Morehus, Kellogg.—Mr. Greene proposes (*l. c. 3*) to take up this species first described by Dr. Kellogg (Proc. Cal. Acad., ii., 36). It is a small tree, thirty feet high, widely distributed in the California coast-ranges and in the Sierra foot-hills, but nowhere common. It is nearly intermediate in character between the deciduous leaved *Q. Kelloggii*, the common Black Oak of the Pacific coast forests, and the evergreen *Q. Wislizeni*, and it has been suggested that it may have been produced by a cross between these two species—a view which Mr. Greene does not share, and which he believes to have been impossible. I have no knowledge of the plant beyond what has been gained from the examination of a single herbarium specimen in fruit, and from Mr. Greene's description.

277. Quercus falcata, Michx.—There are, perhaps, three older names for the Spanish Oak than that of Michaux published in 1801. It has been sometimes thought that the *Q. rubra digitata* and *Q. rubra montana* of Marshall had reference to this species, but there is a vagueness in the descriptions which leaves some doubt as to just what tree he had in mind. It will therefore be safe to pass by these names entirely and take up the *Q. cuneata* of Wangenheim (Amer. 78, t. 5, f. 14, a), published in 1789, or fourteen years before Michaux's name. Wangenheim's figure represents a leaf of the trilobed form of the species—the *Q. triloba* of Michaux.

288. Quercus cinereia, Michx.—The reference of this species to the *Q. humilis* of Walter, which is several years older than Michaux's name, is too uncertain, without an examination of Walter's herbarium, which is preserved in the British Museum, to make any change of name for this species possible.

Quercus Leana, Nutt.—This tree has generally been considered a natural hybrid, between *Q. imbricaria* and *Q. coccinea* or *Q. tinctoria*. It is now known in several widely scattered localities, from the neighborhood of Washington, D. C., to Missouri; and there seems no reason, whatever its origin may have been or however recently it may have appeared, why, if *Q. heterophylla*, which many excellent observers have always considered a hybrid, is included as a species in the American Silva, *Q. Leana* should not be included also. It should follow immediately after *Q. imbricaria* with which its relationship is obvious.

Quercus Macdonaldi, Greene.—This is described as a small deciduous tree by Mr. Greene (West American Oaks, 25) who discovered it on Santa Cruz Island, California, with

a variety *elegantula* from the southern part of the state. I have not seen specimens of these trees, and have no knowledge of them beyond that derived from Mr. Greene's descriptions. *C. S. Sargent.*

Abies Fraseri.

AN interesting feature of the forest-flora of North America is the multiplication of species of Fir (*Abies*). The American forest, if we include Mexico with its single Fir-tree and consider *Abies concolor* as truly distinct from the Fir of the north-west coast (*Abies grandis*), contains ten species of these trees; while in the rest of the world there are known only eleven species, even allowing that some doubtful ones like *A. Cephalonica* and *A. Appolinis* of the Orient are really specifically distinct from the widely-distributed *A. pectinata* of Europe—a view which has not been held by the most competent observers of these trees. Europe, in addition to *A. pectinata*, possesses a second species (*A. Pinsapo*), confined to the Spanish Sierras, and to some of the high mountain-ranges of north-western Africa. In the Asia Minor and Caucasian region there is a group of four closely allied species or varieties, including the two we have already mentioned and *A. Nordmanniana* and *A. Cilicica*. The forests of the Himalayas contain one species with two rather distinct forms, while another Asiatic species (*A. Sibirica*) is widely distributed through the more northern parts of the Continent. In Japan three species are known. The true home of the genus, therefore, if the multiplication of forms indicates that a genus is more suited to flourish in a particular region than in another, is western North America, where Firs are found upon all the mountain ranges from the Arctic Circle to the high peaks of central Mexico.

Two species occur also in eastern America, *Abies balsamea*, very widely distributed over all the boreal parts of the continent and extending far north from the Atlantic to the Pacific, the only Fir in the Northern States, and *A. Fraseri*, found only upon a few of the highest slopes of the Alleghany Mountains of Carolina and Tennessee, so that, next to the Californian *A. bracteata*, it is by far the most restricted in its distribution of the American species, which usually range over wide areas.

Our illustration upon page 475 shows a characteristic forest of this tree as it appears on the Carolina mountains at an elevation above the sea-level of about 5,000 feet. This particular forest covers the high slopes of the Black Mountain range, a lateral spur from the Blue Ridge near Asheville in North Carolina. The highest point of the range and the highest land in North America east of the Rocky Mountains, Mount Mitchell, appears in the distance.

Abies Fraseri is a small, short-lived tree, rarely growing to a height of more than seventy feet, with a trunk in full-grown individuals sometimes two and a half feet in diameter, with bright cinnamon-red bark, becoming gray as the trees begin to reach maturity.

It is not easy to distinguish at a glance, and without the cones, this species from the northern Balsam. The two trees resemble each other in foliage and in habit, and the appearance of the bark in old specimens is very much the same. The structure of the leaves, however, as Dr. Engelmann has pointed out, offers characters which serve to separate the two species, those of *A. balsamea* being almost destitute of the hypoderm cells which appear on the upper side of the leaf of *A. Fraseri* in an almost continuous layer. The two species, however, are at once distinguished by the cones. Those of *A. Fraseri* are shorter and more oval in outline, with largely exserted and reflexed bracts, while the bracts of the mature cones of *A. balsamea* are included in the scales, or rarely with their points only protruding. The white bands, composed of stomata on each side and parallel with the mid-rib, found in the lower surface of the leaves of all Firs, are much broader (with eight to twelve rows) in the case of *A. Fraseri* than in that of *A. balsamea* (usually with six rows)—a character which may be relied upon generally to distinguish sterile plants of the two species.

Abies Fraseri was first made known by the Scotch botanist and traveler whose name it bears, John Fraser, who made several journeys to North America between 1780 and 1810 for the purpose of collecting seeds and plants for London nurserymen. Although Michaux, with whom he traveled in Georgia for a short time in 1782, refers to him several times with great contempt as "un certain Mr. Fraser," no one man has contributed more valuable plants to English gardens; and in the list of his introductions, which is published in the *Companion to the Botanical Magazine*, ii., 300, appear the names of some of the best garden plants found in North America, among them *Rhododendron Catawbiense*, parent of all the race of the hardy Rhododendrons of modern days. Michaux must have confounded the Fir of the southern mountains with the northern species, and it does not seem to have been introduced into European gardens until 1811. It is very well figured in the "*Pinetum Woburnense*," published in 1839, from a specimen then sixteen years old in the Duke of Bedford's collection; but it is very doubtful if there are now any old plants anywhere in cultivation. This tree is short-lived, and the plants of Fraser's introducing must have passed away long ago, while of late years seeds of *A. balsamea*, collected in Pennsylvania or in Canada, where specimens are occasionally met with, in which the tips of the cone-bracts are slightly exserted, have been very generally sold as *A. Fraseri;* and it is only within the last dozen years that the Arnold Arboretum has been able to distribute a supply of seedlings of the Carolina tree among the lovers of conifers in the United States and in Europe.

Abies Fraseri has little to recommend it as an ornamental plant; and, economically, few American trees possess so little value. It is perfectly hardy, however, in Massachusetts, and some of the plants in the Arboretum, although scarcely six feet high, have already produced cones.

C. S. S.

New or Little Known Plants.

Aster Herveyi.

THIS very rare plant, of which a figure is now first published upon page 413 was discovered a few years ago by Mr. E. W. Hervey on the borders of an Oak wood near New Bedford, Massachusetts. It was found subsequently by Professor Sargent in Tiverton, Rhode Island, growing on the gravel fill of a new road; and again within a few years by Mr. C. E. Faxon, in Muddy Pond woods, and near Blue Hill, in Norfolk County, Massachusetts.

*Aster Herveyi** is a slender, low plant, growing to a height of one or two feet, with numerous loosely corymbose heads, with lilac or violet rays half an inch long. Like nearly all the North American Asters, it takes kindly to cultivation, and makes an excellent autumn-blooming border plant. The *Biotia commixta* (D. C., "Prodromus," v. 265), an old inhabitant of gardens of unknown origin, is, according to Professor Gray, a robust cultivated form of this plant.

Foreign Correspondence.

London Letter.

I WROTE last week of the splendor of our open-air gardens since the outburst of warm sun after the long period of rain. Not less remarkable, just now, is the indoor garden also, which, after its usual dull season at the height of summer, has begun to assume its wonted gay aspect in autumn, and during the past week I have had the opportunity to see some fine examples of glass-house gardening. At the present moment the plant of plants undoubtedly is that lovely Chilian climber, the Lapageria, which is to be found now in almost every green-house throughout the land. In one place I saw a plant covering the entire roof of the green-house, and the

**Aster Herveyi*, Gray, Manual Bot., Northern U.S., 5th ed., 229; syn. Flora, i., 2, 175.

Fig. 131.—Aster Herveyi.—See page 472.

shoots were thickly wreathed for several feet with the crimson bell-like flowers of the one sort, and the waxy, pure white blossoms of the Alba variety. There are now several named varieties of the typical *L. rosea*, which vary more or less from the original and from each other. The finest, as regards color, is unquestionably that known as the Nash Court variety, which is now being distributed. The flowers are very large and of perfect shape, while the color is a rich rosy-crimson. Another sort, called Superba, is also very fine, and last week Messrs. Fisher, of the Sheffield Nurseries, who make a specialty of the plant, showed two varieties, named Floribunda and Maculata, the first, a large-flowered and rich-colored sort, said to be exceptionally floriferous, the other, with flowers of pale rose-crimson, conspicuously veined and spotted with white. These are

among the best varieties, but there are many decidedly bad sorts obtained from seed, being poor in color and small in bloom. Some clever people have hybridized the pure white Alba with the red, the progeny being a mongrel race, neither white nor red. The white still maintains a high price in nurseries, chiefly because its propagation and growth are not rapid, and the finest form of it is always in great demand. The climate of an English green-house seems to suit the Lapageria to perfection, due probably to the almost perpetual moisture, for the plant abhors strong heat, dryness and strong sunlight. It is not too much to say that the Lapageria is the most popular and most valuable green-house plant introduced during the present century, and it is doubtful if the Veitchian travelers will ever send home a rival to it.

Orchid-houses, so long almost flowerless, are now bright with several early autumn flowers, and none is more beautiful than the Blue Indian Vanda (*V. cærulea*). I saw some magnificent plants of it this week in full flower in an ordinary green-house, where the plants have plenty of ventilation and not too much heat, and this is the secret of growing this Orchid well. Many stifle it, with other Vandas from the hot tropics, the result being that the Blue Vanda always looks sickly and rarely flowers well. There are many forms of this Vanda, and there is a wide difference between the finest and the poor forms, the latter having small flowers, almost white, while the best variety has flowers four inches across, of a deep Tyrian purple, tessellated with white veins, and this form, which is a gem among Orchids, I know, exists in one of your famous American collections—that of Mr. Corning, near Albany. Other Orchids in flower and worth notice, would, of course, include the handsome old *Odontoglossum grande*, still the noblest of the genus, and a plant which can be grown to perfection without the aid of a specially constructed Orchid-house; indeed, the best specimens I have seen lately were growing in a green-house with other kinds of plants. The new *Vanda Sanderiana* is not heard so much about now, and there is no disguising the fact that, as a rule, it is a difficult plant to manage successfully. At Kew, where there is a good specimen in flower just now, it is growing admirably in company with other eastern tropical Orchids. There is something very fascinating about the large flat flowers, with their strange combination of color, rose-pink and olive-brown, though they do not captivate visitors so much as the splendid *Cattleya Dowiana aurea*, which for the past week or more has been perfection. It is not often that this Orchid is seen with four flowers on a spike, and the fact is worthy of note, as it shows how finely the plant is grown at Kew. Another very remarkable Orchid in flower at Kew is an exceptionally fine variety of *Miltonia Moreliana*, which is far finer than the rare Atrorubens. The flowers are three inches across, the sepals a deep claret-purple, the broad labellum rosy-crimson, reticulated with darker and paler veins. It is known as the Kew variety, and is the envy of all Orchid-fanciers who have seen it during the past month and in former years. Orchid sales are for the moment quiet, but I notice that the wonderfully fine collection of Mr. Partington, at Cheshunt, is to come under the hammer next month. It is well known that some of the finest Phalænopsis in the country are in this collection, and it will be a good opportunity for Americans to secure grand plants. Mr. Watson gave you a description of them recently, and they astonish almost all who see them for their large size and extraordinary vigor.

The cool conservatories at Kew contain numerous out-of-the-way plants in flower that deserve to be more popular, and one of these is a Cape bulb, *Cyrtanthus hybridus*, which, I believe, was raised some years ago in Sir Trevor Lawrence's garden. To describe it, it must be compared with the beautiful old *Vallota purpurea*, or Scarborough Lily, but its flowers are smaller, more funnel-shaped, and more blossoms are borne on the dwarfed spikes. The color is somewhat different, being of a softer scarlet. As it flowers at various seasons of the year it is more valuable as a garden-plant than the Vallota, which only flowers in autumn. Another beautiful Cape bulb is a new variety of the well-known *Tritonia aurea*, which has been introduced by Mr. J. O'Brien. It differs from the original in having the petals marked with a large crimson blotch, which, on the bright orange ground, is very effective. There is, also, at Kew, a very robust variety of Tritonia, having spikes from three to four feet high, carrying flowers three inches or more across of a richer color than the ordinary sort. It is an invaluable plant for the green-house in summer, and, as it has already found its way into various gardens, it will probably supplant the old form in course of time.

The Neilgherry Lily (*Lilium Neilgherrense*) is one of the leading features at Kew, for, in one of the green-houses, there are many plants in flower—more than I have seen together before. It is a noble and beautiful Lily, a good deal like *L. longiflorum* in growth and flower, the latter being about eight inches long and of a soft, creamy-white color, which, to artistic souls, is more enjoyable than what they call the cold white of the *Lilium longiflorum*. The Neilgherry Lily has always been considered difficult to grow and flower well, but at Kew they seem to have hit upon its peculiar requirements, as, indeed, they have with every other kind of Lily during the past year or two, as every kind is grown here now better than I have seen them anywhere, although, a few years ago, it was said by Lily experts that it would be hopeless to expect Lilies to thrive on the dry, gravelly soil at Kew. The success achieved proves what may be done by ignoring empirical practice and striking out a new line, as the directors have done here in Lily culture. The other green-house Lilies in flower now are chiefly forms of *L. speciosum* or *L. lancifolium*, though they are quite hardy, and grand masses of them are in flower in the open air. Besides the large, dark-flowered varieties, like Hovey's Melpomene, there are some beautiful effects obtained with the white Krœtzeri, and a group of it, intermingled with the blue African Lily, *Agapanthus umbellatus*, produces one of the most beautiful and striking combinations in the green-house—a mixture well worth imitating. Krœtzer's white is so much superior to the ordinary white that it is superseding it. The old form is almost always suffused with pink, but the other is pure, and may be readily recognized by the greenish-white ribs on the petals.

Picking out the good things in flower in the stoves at Kew, this week, I should note *Passiflora kermesina* as one of the very best small stove climbers in cultivation. It has for some time past been crowded with its lovely cherry-crimson flowers, while its growth is always elegant, and it is of the simplest culture. *Pleroma macranthum*, also known as *Lasiandra macrantha*, is also a very beautiful and reliable green-house plant for covering a wall, pillar or roof. It now carries a profusion of large flowers of the richest purple imaginable. A new composite from Mexico is likely to prove a good green-house plant. It is herbaceous, with a tuft of deeply-cut leaves, from which arises the tall, slender flower-stalks, with flowers three or four inches across, of the brightest orange-scarlet. The flowers have a single row of florets, very long and narrow, and these reflex prettily, as in the beautiful *Mutisia decurrens*, from South America, which grows and flowers against an open-air wall here. The new plant is named *Gerbera Jamesoni*, and I notice that the chief nurseries are working up stocks of it. It is a cool-house plant, of easy culture, and its flowering season extends over a long period. I know no other composite of exactly the same bright color.

London. *W. Goldring.*

Cultural Department.

Autumn in the Garden.

ALL things considered, the past season has been extremely favorable for hardy flowers, having spared us that most arduous of tasks—persistent watering to supply a deficiency of moisture during the heated term. Every one who has a garden, whether he work in it himself or not, knows the disastrous effect of an extended drought, when, one by one, the flowers begin to flag, unless constantly revived by the garden-hose and frequent stirring of the soil. To neglect this at such a time, whatever the cost of labor, is simply to mar the appearance of the garden for the remainder of the season. The plants may partially revive with the coming rain, but they will have lost that freshness which care might have preserved.

The effect of a generous rainfall the past summer has been apparent in an earlier and more profuse blossoming, together with a stronger growth of stalk and foliage in the case of the majority of flowers. In no plant is this more visible than in the Japanese Anemones, now a carnival of rose and white florescence. For one season, at least, the Japanese Anemone has drunk its fill of moisture; and, wherever placed, this graceful plant is a cynosure and a delight. Charming when dotted amid the shrubbery and borders, it should be far more generally utilized in beds and masses, especially the white variety. The white Phlox, when well grown, approaches but does not equal it, though it is earlier to appear. One of the numerous charms of the Japanese Anemone is its late-flowering habit; the chill autumn equinox comes and goes, but the Anemone still blossoms on. The rose-purple variety, or rather the type, is not so pleasing on first unfolding, but its color improves as its flowering advances and becomes, later on, a distinct and exquisitely beautiful shade which is supplied

by scarcely any other flower except the autumn Colchicum. It is a color we could not spare from the October garden, and in its later stage the flower vies in delicate beauty with its statlier white sister. The Anémone is not over fastidious as to soil, and should be placed both in sun and shade, or partial shade, to lengthen its flowering season.

Fitting companions to the Anemones are several species of the perennial Sunflower, notably the double *Helianthus multiflorus* and *H. orgyalis*. The larger forms, like *H. tuberosus*, are too coarse for the flower-borders proper, or the shrubbery of the foreground. On no account, however, should they be banished, but be placed in the rear garden, or set against a distant shrubbery, where their golden lights may shine. Among the extensive Sunflower tribe there are few species more showy during late summer than the large *Silphium perfoliatum*—a steadfast bloomer throughout August, and handsome enough during its blossoming period to merit a post of honor anywhere. The Sunflowers, it may be said, were born without cultural directions. Nevertheless, in the case of the double Multiflorus, occasional division is of great benefit to the vigor of the plants and the numbers and size of the flowers.

Attractive objects during autumn are the Eulalias, or tall Japanese Grasses, the type being the most robust. This may be used with fine effect on either side of a gate or entrance to the grounds. Where a thick, tropical-looking screen is desired during summer and fall, the Eulalia has few equals. *Erianthus Ravennæ*, a tall growing, reed-like perennial from southern Europe, resembles it, but does not equal it for ornamental purposes. Both flower during October, the large plumes of the latter resembling those of the tender Pampas Grass. During July and August *Eulalia Japonica variegata* is always handsome. Less robust than the type, and more sensitive to wind and heavy rains, it is apt to become beaten down in autumn. The smaller variety, *E. J. Zebrina*, its foliage marked crosswise with bands of white and green, holds itself more erect, and is one of the most distinct and ornamental of rushes or grasses.

A fine combination for a bed might be made with a few specimens of the type for the centre, surrounded by the smaller silver-leaved Zebrina. A bed of purple-leaved Cannas, with their scarlet, Strelitzia-like flowers, fringed with the white Japanese Anemone, would also be worth looking over to see in one's neighbor's garden. And, for a change from the tiresome Geranium-bed, why not a bed of fragrant yellow and white Iceland Poppies, which are so easily raised from seed sown the summer before they are required, to be succeeded by the Salvia's flame. Or, if Geraniums must be used, a bed of the salmon or light-colored kinds, even if they be not quite

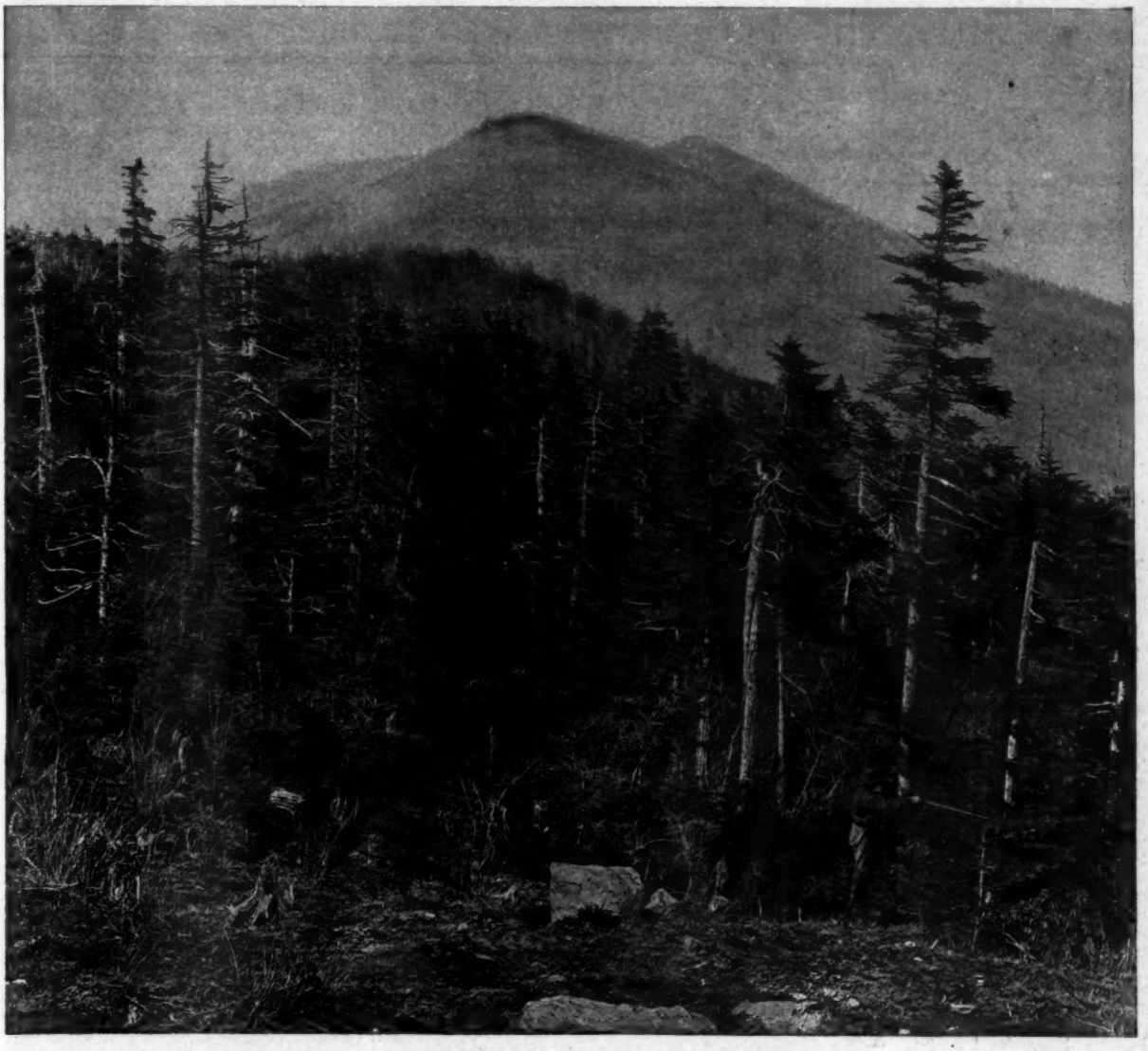

Fig. 132.—The Home of Abies Fraseri.—See page 472.

so free flowering, to vary the monotony of General Grant, which so often figures as the centre-piece—sometimes even of a clam or oyster bake—upon the lawn.

The first of October finds the large Phloxes mostly past. The trade catalogues abound with so many long lists of varieties that it may be well to specify a few that have been tried and not found wanting. Brilliant and handsome as are the big Decussata Phloxes, they are not without objectionable colors, particularly the rose and rose-purples, while of two varieties, almost similar in the color of their flowers, one may be a much less vigorous grower or have much smaller trusses than the other. Of the whites, Vièrge Marie and Queen of the Whites are among the best, the former the tallest and more robust grower and the latest to flower. Of the light reds, Rêve d'Or, Gambetta, l'Avenir and Lothair are distinct and beautiful, the latter one of the most brilliant of its class, and among the most brilliant of hardy flowers. Isabey, a variety recently sent, much resembles it, and appears to be equally vigorous. Parrai, a new variety, is the finest of the rose-colored kinds, both in truss and color. Intermediate between white and rose, two old varieties, Richard Wallace and Premier Ministre, are unexcelled, while Oberon still remains the most gorgeous deep red.

Just now the perennial and annual Asters appear, to contribute a needed color—purple and its various shades—a compliment to the hardy Sunflower's gold. Even the common Aster of the fields and road-sides is well worth growing amid the shrubbery and the wild garden, while the China Aster, in its more varied hues, lends an almost spring-time gayety to the garden during late September and October. It is, moreover, very desirable for cut-flowers. Usually, the mistake is made of too early sowing. Sown the latter part of June in shade, in the open ground, the annual Starwort will come into bloom at a time when it is really required. A touch of white frost only accentuates its colors, and, weeded of its objectionable shades, it is among the most desirable of garden annuals. Neither should the old-fashioned Dahlia be overlooked by any who have an appreciation for color; it helps to woo the slanting sunbeam and lengthen the shortening October day.

The Angelica-tree, or Japanese Aralia, is at present a tropical-looking shrub on the lawn, with its large tripinnate leaves, spiny stems and grand crown of white blossoms. Unfortunately, this is rather tender, requiring protection during winter. The gay flowers of the Roses of Sharon, too, an occasional second flowering Bee-larkspur, and purple Clematis, and the colored fruits of many of the ornamental shrubs are now conspicuous and contribute their quota of color.

But the beauty and pleasure of the garden at this season will depend largely upon the care it receives, and no little work is called for in cutting out the withered branches and removing the withered leaves, as well as keeping walks and borders free from weeds, and the sward properly shaven. We weed and hoe, and stake and "edge" in summer—we neglect the garden in autumn, when, with proper care and judicious planting, it may present an aspect of almost equal beauty. Can all the golden days of summer create a flower more chastely fair than these lovely, nodding Wind-flowers of October, with their spotless petals surrounding the pale-green stigma and feathery-golden stamens; and shall I let this sweetest tribute of the latter year rear its beauty amid neglected surroundings!

While referring to autumnal flowers the question of spring, versus fall planting may be briefly considered. As a general rule, fall planting is to be commended, provided it be done early, the plants thus being enabled to take hold of the soil before winter sets in and obtain a start for the following year. Of course, there are not a few plants which are set out to disadvantage in autumn, though this will depend somewhat on whether the winter prove severe, or whether the plants receive winter protection. So, also, will successful spring planting be determined largely by the weather, as all successful planting will depend upon the condition of the plants when set out. Plants poorly packed and sent from long distances are expensive to experiment with at any season and at any price. Late-flowering plants, like the Wind-flowers and Monkshoods must be set out in spring; the hardy Coreopsis and most of the Heliantheæ, also, do best when transplanted at that season. Hellebores should be moved early in the autumn, and Pyrethrums, Ranunculus, Iris, Bee-Larkspurs, Pæonias, the large Oriental Poppies, the Decussata Phloxes, and most of the Campanulas are best transplanted in early fall. Besides being a suitable time for the moving of most perennials, early autumn transplanting has the advantage of seeing the plants established, of more intelligent placing in the borders, and, finally, of a fact accomplished when the first garden Snowdrop proclaims the spring returned. *George H. Ellwanger.*

Rochester, N. Y.

Stove Plants in Flower at Kew.

Ixora macrothyrsa.—This is a most superb plant for the stove. It is unlike all other garden Ixoras in the size of its flower-heads, strong plants producing heads fully nine inches across and as full as a Hawthorn blossom. The color is bright, glowing crimson. A plant at Kew has been in flower three weeks, and its blooms are still as perfect as when they first opened. For large stoves no Ixora equals this one. The treatment of most of the plants of this genus includes severe pruning every spring and the stopping of the most vigorous shoots, with a view to obtaining compact plants with numerous short branches, each of which will bear a cluster of flowers. But *I. macrothyrsa* must not be treated in this fashion. The branches must be allowed to grow unchecked, and, with liberal treatment, they should become three or four feet long. The longer and stouter the branches, the larger the heads of flowers will be. After flowering, the strongest branches should be cut back hard, and when they have broken again they must be repotted and treated liberally. As a rule, the shoots do not become strong enough to flower until they are about two years old. The garden name for this plant is *I. Duffii*.

Gustavia gracillima.—Although introduced and flowered by Mr. Bull for the first time in 1875, yet this plant appears to have flowered only very rarely. It flowered at Kew in 1883, and is again in bloom in one of the stoves there. It is about four feet high, erect, unbranched, with linear, bright green leaves, and even when not in flower is ornamental. The flowers are developed in clusters on the ripened part of the stem, and they have scarcely any stalk; they are about four inches across, and composed of eight broad, overlapping petals, surrounding a broad disc-like cluster of yellow, purple-tipped anthers. Several other species of Gustavia are cultivated at Kew, and have flowered on rare occasions. A considerable number of the section of Myrtaceæ, to which Gustavia belongs, have flowers of large size and exceptional beauty, but they do not flower under cultivation here. Such are the Cannon-ball tree (Couroupita), Barringtonia, Lecythis, etc., plants which are easy to grow but fail to flower, probably through lack of intense sunlight. *G. gracillima* is a native of the United States of Colombia.

Ataccia cristata.—The very remarkable and ornamental plant grown in gardens under this name belongs to a small, natural order nearly related to the Amaryllids. When well managed it flowers freely and presents a picture of more than ordinary attractiveness. It has dark, purplish-green, ovate, thin leaves a foot or so long, with a petiole about four inches long. The flower-scape is erect, about one and a half feet high, stout, angled, purplish, and bearing on the apex four large bracts, two of which are parallel, erect, five inches long, and suggestive of the large dorsal sepal of *Cypripedium Lawrencianum;* the other two, which are placed beneath the flowers, are boat-shaped. The flowers are purple, one inch across, and composed of six reflexed calyx-lobes, no petals, a ring round the mouth of the shallow tube, and a short, thick, six-furrowed stigma. In addition to the perfect flowers there are also numerous whitish filaments, six inches long, springing from the base of the bracts, and these filaments are really abortive flowers. It is difficult to describe the plant so as to convey an idea of its ornamental character. It should be grown in a moist stove, and potted in fibrous peat and sphagnum with a sprinkling of sand and charcoal. It likes abundance of water all summer, and less in winter. Plants three feet through and bearing thirty flower-scapes have been grown by means of this treatment.

Kew. *W. Watson.*

Notes From a Northern Garden.

Grapes have matured much earlier and more fully this year than usual. We are apt to forget about the seasons, but for Grapes I think this is the earliest here since 1870. Our standard for a warm season is the perfect maturity of the Concord, which is quite rare.

Moore's Early, or, as I find it sold in Boston streets, the "Early Concord," ripens fairly here, though it is less early than Champion. The season of Moore's Early, Salem, Delaware, Israella and Eumelan are so close together that it is impossible to give either the precedence. In a season that is steadily warm from May to October, the Brighton is very early—even earlier than any above named; but in a summer with "cold spells," like this and last year, it does not even color.

The Champion Grape I have always regarded as the earliest and the poorest of all cultivated sorts—unfit for any but culi-

nary use. But this year it is suprisingly sweet—so much so that I at first thought I must be mistaken in the sort. It is very hardy and productive, and, if it were generally as good as I find it this fall, would be a profitable Grape for the far north. I think a vineyard of it would yield more bushels than a potato patch of the same size.

THE THRIPS increase annually on my vines, but although the foliage appears to be considerably injured, especially on the Delawares, the crop is not noticeably lessened. But I think the vitality of the vines must, in the end, be impaired. The thick, dark foliage of Moore's Early seems to be invincible to this insect.

THE SHIAWASSEE BEAUTY APPLE rises higher in my esteem year by year, as I become better acquainted with it. This season, when there are but few apples, and of these few most are ruined by insects, Shiawassee is large, fair and perfect. A seedling of the Fameuse, it is yet quite distinct, being larger, more flattened, more brightly red, and distinctly more acid, though with the true Fameuse flavor. The tree is very hardy, having endured several of our severest winters; and above all, in point of comparative merit with its parent, it is free from the fungus spotting so ruinous to the Fameuse.

A NEW APPLE PEST, known in Vermont as "the Railroad Worm," because in its first inroads it followed the tracks, is doing immense damage. At first it attacked only early and sweet varieties, but now does not discriminate, except, perhaps, by preference for the softer-fleshed sorts. This minute insect enters through the skin when the fruit reaches maturity, and bores a net-like track through and through the apple, converting the flesh into a brownish spongy mass, with unaffected pulp in the intermediate spaces. Its presence is indicated in the mature fruit by dark depressed lines upon the surface; but this disfigurement bears but a slight proportion to the actual injury, which results in utter worthlessness, even in apples showing but slight external marks. I call the insect "minute," because, though cutting the apples in search of it at various stages, I have never found it, and should have supposed it some sort of fungus had I not been assured that it is a worm.

Newport, Vt. *T. H. Hoskins.*

[The insect referred to is evidently the *Trypeta pomonella*, Walsh, known many years in some of the Western states, but which has not been reported as injurious in this section. The fly, for it is a true fly, is not more than one-fourth of an inch in wing expanse, of a rather deep brownish-yellow color, shining, and with prettily banded wings. The eggs are laid on the apples, usually on the thin-skinned varieties, and the maggots bore in every direction, as described above. In length it does not exceed one-fifth of an inch, and it is of a greenish-white or yellow color. When full-fed, in early September, or even earlier, the larva leaves the apple, drops to the ground, and burrows a short distance under the surface, where it changes to a pupa, emerging about midsummer of the following year. No practical remedies, so far as we are informed, have been suggested, as it has not proved so seriously injurious heretofore as to make special study necessary.—ED.]

Orchid Notes.

Lælia Perrinii.—This elegant and free-blooming Orchid is not grown so extensively as its merits deserve. With ordinary treatment it grows strongly, and, what is more, produces its flowers at a season when there is the least number of varieties blooming. *L. Perrinii* has stout, deeply-channelled, clavate bulbs, and a single deep green leaf of a leathery texture, and about one foot long. The flowers, from three to six, are about five inches across, and rosy-purple, while the front lobe of the lip is of a purplish-crimson, the throat being white. This species was introduced from Brazil in 1831. It will grow best in an intermediate-house, with a good exposure to sunlight and abundance of air when the weather is favorable. Some pale varieties have been introduced recently, but are still very rare. These are Alba, with pure white flowers; Nivea, white, with the lip margined with rose, and Irroratus, rosy sepals and petals and nearly white lip.

Lycaste (*Paphinia*) *grandis* is the rarest and largest-flowered of a singular genus of Orchids now included in Lycaste. It is of a very compact habit, scarcely exceeding six inches in height, with ovate-clustered bulbs and thin plicate leaves. The scapes are pendulous, and to show the flowers to advantage the plants should be grown in baskets or small, shallow pans. The flowers are about six inches across, the lanceolate sepals and petals being chocolate-brown, barred and edged with cream color. The claw-like lip is blackish-purple, with the front lobe cream-colored and surmounted with a tuft of hair. This plant, with its congeners, needs a good deal of heat, and it should never be allowed to become dry. Very little potting material is required, and that may be a mixture of fibrous peat and moss. It was introduced from Brazil in 1884, and a few seedlings from one of the first introductions will soon be in bloom with us.

Odontoglossum Bictonense was the first species of the genus to reach England alive. It has an extensive range through Mexico and Guatemala, and was introduced from the latter country in 1835. Though it may not be compared to its superb and larger-flowered congeners of later introduction, still, when in fine condition, the many-flowered, branching racemes are by no means unattractive. It is of very robust habit, with oblong-flattened bulbs, surmounted by two to three undulated deep green leaves. The stout, erect racemes are often branched, and bear many greenish-yellow flowers, prettily spotted with brown. The cordate-acuminate lip is usually pink, but there are a great many varieties, the most distinct being one with a pure white lip. This Orchid prefers the intermediate-house, in well-drained pots of peat and moss, abundance of water during growth, and a decided rest by withholding the water to a certain extent during winter.

Kenwood, N. Y. *F. Goldring.*

Oncidium varicosum Rogersii.—The extraordinary flowering qualities of this Oncidium has rendered it very popular, and we now find it grown extensively. Its strong, well-branched spikes, which attain a length of three and four feet, make their appearance at this season, and are laden with massive flowers of great brilliancy; the sepals and petals are small, barred and spotted with brown; the lip, however, is a rich golden-yellow, broad, flat and, in some instances, beautifully undulated, and furnished with a claret-colored blotch in the centre. Spikes carrying from eighty to one hundred flowers are of common occurrence, and even comparatively small plants will produce this number when properly managed. It is, however, advisable to cut the spikes from such plants as soon as the flowers are fully expanded, so that their strength may not be exhausted and prevent their blooming the following season. Like most Oncidiums, they delight in an abundance of air during growth and a position as near the light as possible. Very little compost is necessary about the roots, but good drainage is very essential. Baskets are better than blocks. They do not dry out so rapidly during our hot summer weather.

Sophronitis grandiflora.—This is one of the gems of our dwarf Orchids and very easy to cultivate. It occupies very little space, and produces its rich scarlet blossoms at this period with the young growths. The individual flower measures from two and a half to three inches across, and is round, well formed and of good substance, remaining on the plant five or six weeks in good condition. Its cultural requirements are simple, and, if placed firmly in baskets or pans where plenty of light and air is available, it will grow and flower very freely. While growth is being made, it should occupy a cool position, for if grown too rapidly it will not bloom. When the flowering period is over, water may be withheld to thoroughly ripen the bulbs. During the winter months it should be grown in a temperature of fifty-five to sixty degrees. One of Mr. Hicks Arnold's cool houses, in New York, was recently ornamented by a well-flowered group of these Orchids.

Summit, N. J. *A. Dimmock.*

Aponogeton distachyon, the Cape Pond Weed, is a pretty and very desirable aquatic plant for the decoration of the greenhouse in winter, not only for its quaint form, but also for its delicious fragrance and the pure white color of its flowers, or, correctly speaking, bracts. The foliage also is most beautiful, being borne on long stems to enable it to float and present its bright, shining, green surface as a foil to the flowers. As it is strictly a winter-flowering plant we have found it difficult to change its season, so as to flower it in summer. If this could be done, the Aponogeton could be easily naturalized, and it would prove hardy here in the East, but in the more favored states, as to winter climate, the Aponogeton may be easily planted out in streams or ponds and will take care of itself and increase very rapidly. We usually take the roots out of the old soil in September, and plant them in pots suitable in size to the strength of the plant, and then immerse the pot to about twelve inches below the surface, when in about seven days flowers appear simultaneously with the foliage, and at once fill the structure with their fragrance. In this way unsightly cisterns, or other receptacles of water, may speedily

be made to have an interest of their own. It should be added that the soil should be well enriched with well decomposed cow-manure. About one-third of this with the rest of ordinary garden soil, with a sprinkling of charcoal added, will be found a suitable compost for the purpose. If it is desired to increase the stock, this is easily and rapidly done by means of seeds, for after the flowers have been in full beauty for a month the bracts begin to turn green, and seeds are formed, and when these are ripe the bracts dissolve and the seeds sink at once to the bottom and germinate in about seven days. These will form small bulbs the size of a pea the first season, and will flower the second year of their growth, and these increase in size with the strength of the bulb or tuber. After the plants have flowered for six months they manifest a desire to rest, and when this is the case they may be allowed to gradually die off. We then, for convenience sake, keep them out of the water, but never allow them to become dust-dry, just keeping them moderately moist until fall, when they are started again. We are acquainted with no more suitable plan for planting in aquaria or any similar situation. *O.*

Passaic, N. J.

The hybrid Montbretias seem to increase in attractiveness every year, and one can hardly help feeling grateful to the French growers who first obtained them by intercrossing *M. Pottsii* and the old *Tritonia aurea*, or *Crocosma aurea*, as it is otherwise called. It was M. Lemoine, of Nancy, who first effected this cross, calling the progeny *M. crocosmiæflora*. The hybrid combines the vigorous growth and abundant flowering character of *M. Pottsii*, with the large flowers and richer color of the Crocosma; while, as is often the case with hybrids, it possesses a more vigorous constitution than either parent. The flowers are about half as large as those of the Crocosma, but of a much richer color, being almost entirely scarlet, and many flowers are borne on each stem that overtops the narrow foliage. The habit most resembles that of *Montbretia Pottsii*, and so rapid is its growth that a small plant will, in a season or two, spread into a mass several feet across, instances of which may be seen at Cheswick and Kew. The hybrid is, moreover, very persistent in bloom, lasting for several weeks, and it does not suffer from excessive rain. The graceful flower-spikes are invaluable for cutting, though they do not last long in vases. There is a bright yellow variety named Boule d'or, and other fine varieties have been raised by M. Lemoine.

Kew. *W. G.*

The Forest.

The Forest Pavilion at the Paris Exposition.

WE have already given some notes on the forestry exhibit made by our own government at the Paris Exposition, and we are glad to add some account of the display made by the French government in the same direction. The following description of the pavilion and the principal forest-material which it contains is the translation of part of a letter to the *Independence Belge*, which was kindly furnished us by a lady much interested in forestry. Next week we hope to publish the more important part of the article, which explains how the actual work of the *Administration des eaux et forêts* is exhibited in photographs, dioramas, models, etc.:

Among the marvels of the Exposition is the pavilion of the Executive Department of Forestry on the Trocadéro, constructed entirely of the trunks of trees. Leaving the broad walk and following a foot-path through the turf, we come to a little hillock of natural rock covered with Ivy and creeping-plants, and, mounting a few steps, hollowed in the rock, or made of natural pieces of wood, we reach the verandah which surrounds this picturesque pavilion.

The peristyle is formed of high columns, which are magnificent trunks, carefully selected, and straight as arrows. Each species is represented by a perfect specimen and all are disposed so as to bring out soft harmonies and contrasts of color.

There are Oaks of various forms, Hornbeams, Elms, wild and cultivated Cherries, deeply-ribbed Locusts, Poplars, black and gray, Firs, with reddish bark, Maritime Pines, with purplish scales, Spruces, Lindens, Ashes, glittering Birches, Beeches, with bark of the finest texture, and Service trees, with a covering like a coat of mail. Every specimen carries its certificate of birth in a label fastened to the bark. Most of them are centennarians, and many are 150 years old.

The walls are covered with a mosaic formed of natural wood, bark and tresses of ligneous fibre; the ceilings are also composed of original designs in wood, carved and sawn; the capitals, cornices and balconies are of branches, knotted and twisted, as if they were carved; the roof is made of shingles, with the gray and violet shades of slate, and the effect of the whole is charming.

Under the verandah, where Jasmine, Clematis and Ampelopsis climb, rustic seats are hollowed out of tree-trunks, and those who love the forest, and can understand all its poetry and charm, find an indescribable pleasure in resting here in the shade of this rustic colonnade, where they can inhale the aroma of the trees away from the dazzle and bustle of the exhibition.

The interior of this monument of skill is a rectangular saloon, lighted from above, and surrounded by columns which support a gallery. These columns, too, are superb tree-trunks, arranged in pairs of the same species, so as to form frames for as many panels, on which are collected the different articles made out of the various woods.

Near the Chestnut-trees are gathered staves, tubs, pails and floorings; the Larches have churns and bowls; the Alders, kegs for cement, wooden shoes, guitar-handles and tops; the Beech has sabots, heels and soles of galoshes, porringers, bread-shovels, pack-saddles and saddle-bows; the different Pines have baskets, wood for packing-cases, lamp-lighters, bungs for barrels, together with felt and bagging; the Fir has wash-tubs, date-boxes, oars and carved toys. Between the Linden-trunks we find well and capstan ropes, wood for brushes and hoops; between the Maples, tool-handles, teeth for rakes, spigots, fans; the Wild Cherry has pipes, fine sabots, canes and parasol-sticks; the Pear-tree, carved furniture, chests, veneering; the Walnut, gun-stocks and carriage-panels. Near the Ashes are collected yokes, mast-hoops, shafts, flail-handles, rakes, naves of wheels; near the Oaks are casks, barrels and flooring; around the Cork Oaks are hung soles, rosaries of corks and life-buoys. These collections, arranged as trophies and heraldic devices serve as entertaining object-lessons.

In the centre are the machines which saw, hew, split and work wood and convert it into marketable and useful form. A fountain gushes from among the rocks and Ferns, and here and there are suspended stags'-horns, boars'-heads, skins, furs, while deer, squirrels and other denizens of the forest, carefully stuffed, are grouped around.

On the first floor are arranged the glass-cases containing the herbariums and forest-tree seeds; here, also, are carbonized woods, collections of injurious insects, parasitic fungi, and a complete forestal bibliography.

Recent Publications.

Timber and Some of its Diseases. By H. Marshall Ward. Nature Series. Macmillan & Co., London and New York. 1889. Small 8vo, pp. 295, fig. 45.

This work is based on a series of short articles published in *Nature*, to which the author has added a chapter on the theories advanced to explain the ascent of water in tall trees. This chapter, which fills nearly a third of the whole book, is an admirable summary of what has been written on a very important, but perplexing, subject. The author states in the preface that it will perhaps be regarded as too technical for the general reader, which is probably true, but it is of great interest to the student. Had it been possible to give a more detailed account of the anatomy and microscopic structure of the tree-trunk in the opening chapters, there would have been no reason why the general reader who seeks genuine information, rather than mere entertainment, should not find this important chapter not only intelligible, but interesting. The author does not accept the theory of Sachs that the water ascends in the trunk by imbibition, or absorption by the walls of the vessels, nor does he accept without modification the view of Boehm, R. Hartig, and others, that it passes upward in the cavity of the vessels by capillarity and asmasis. The subject, however, is too complicated to be discussed here, and it need only be said that Professor Ward accepts the views of which Godlewski is the most forcible expounder, that the upward current of water is not due to the action of the vessels, including traceids, alone, but that the living cells of the medullary rays also play an important part in the process, and that the respiration of the protoplasm in these cells is the force to which the upward flow is essentially to be attributed, while capillarity and osmosis play a secondary part.

As it is, the remainder of the book, which is devoted to a description of some of the diseases of wood, is somewhat overshadowed by the prominence given to the subject just mentioned. The account of the diseases caused by *Agaricus*

melleus and several *Polypori*, the canker of Larch-trees, due to *Peziza Willkommii*; Pine-blister, caused by *Peridermium*; damping-off of seedling-trees, due to *Phytophthora omnivora*, is a simple and clear summary of the researches of R. Hartig, Wolf and others, enriched by notes of observations made by the writer himself. The work is to be recommended to all who wish to obtain a scientific knowledge of the bearings of fungus growth on tree-culture.

College Botany, including Organography, Vegetable Histology, Vegetable Physiology and Vegetable Taxonomy. By Edson S. Bastin, Chicago, G. P. Engelhard & Co., 1889, pp. 451, figs. 579.

This work is a revised and enlarged edition of the "Elements of Botany," published in 1887. The principal changes consist in the enlargement of the chapters on the use of the microscope and reagents, the revision of the portion on Vegetable Taxonomy, and the addition of a chapter on the "Succession of Vegetable Life." The Thallophytes are in the present edition treated under the head of algæ, fungi and lichens, instead of being classified by their mode of reproduction as was the case in the earlier edition. The appearance of a second edition of this work so soon after its original publication indicates that experience has shown it to be well adapted to the class of students who desire a general treatise on botany in a compact form.

Periodical Literature.

There is an interesting article on "Floods and Their Causes," by Dr. Felix L. Oswald, in *Lippincott's Magazine* for August, in which the conclusions coincide with those which have been so often insisted on in these columns.

Dr. Oswald says that while men have been disputing about metaphysical subjects, the very basis of organic life has been disappearing from under their feet; that for nearly 2,000 years the inhabitable portion of the earth has decreased at the average yearly rate of 3,500 square miles, and that in historical times some 7,000,000 square miles along the shores of the Mediterranean, once highly fertile, have been changed into worthless deserts. He quotes Mr. Marsh's declaration, that "another era of similar devastations would make the earth an unfit home for its noblest inhabitant, and threaten the depravation, barbarism and, perhaps, the extinction of the human species," and adds that the evil is chiefly due to river-floods produced by the agency of man, and that these floods are caused almost exclusively by the disappearance of arboreal vegetation, and especially by the destruction of the land-protecting highland forests. He thus describes the results:

"Summer suns scorch the unprotected soil, hot winds absorb its last vestige of moisture and fill the air with clouds of loose dust; the slopes of the naked mountains are torn up into deep ravines, and their mould, carried seaward by every rainy spring, is deposited in the form of festering, miasma-breeding coast-swamps. Springs fail, rivers shrink to feeble streamlets, which, at last, become too shallow even to supply the irrigation-canals by which the starving peasants hoped to relieve their distress. And all that misery is aggravated and perpetuated by the ever-recurring ravages of the winter floods. The melting snows, now no longer absorbed by the sponge-like carpet of moss and tangled roots, run off the hill-slopes like rain from a tile-covered roof, and by their accumulation tend to deepen the gorges of the rocky ravines, which in a few hours pour down, in a mad waste, the moisture which once supplied the springs of a thousand mountain brooks. Swollen by the turbid floods of countless simultaneous torrents, the lowland rivers roll down vast masses of detritus, and, by the inevitable laws of gravitation, cover the fields of their upper valleys with the heavy particles of that diluvium, sand and coarse gravel, while the fertilizing slime is carried down to add its stimulus to the rank morasses of a malarious delta. Thus shoaled by yearly accumulations of sand-banks the river-beds rise higher and higher above their former channels, and in every spring, when more than usually heavy snows are thawed by sudden rains, the uplands send down a deluge which no dams can resist, and which often in a single hour demolishes barriers which thousands of workmen have reared by the labors of many years.

"This brief summary outlines an experience which has repeated itself a thousand times, from the barren slopes of Mount Lebanon to the naked terrace lands of the western Pyrenees, and which will not fail to enforce its terrible lessons on the inhabitants of the western Continent, if the forests of our highland regions should be surrendered to the land-blighting axe."

Dr. Oswald believes that deserts can be redeemed only by tree-culture. "Dikes are apt to prolong, rather than avert, the mischief of inundations, as the city of Sacramento, California, had a chance to ascertain at its cost; effluent canals degenerate into morasses, and reservoirs, besides being liable to get shoaled by the accumulation of detritus, constitute a constant menace to the inhabitants of the lower river valley."

It is good to see the truth of the relations of mountain forests to irrigation, and to the fertility of the soil of the country, presented in a popular form. The subject is an important one for the people of the United States, because some influential men who advocate the construction of a vast system of artificial storage reservoirs for irrigating purposes, refuse to recognize the value of the mountain forests as natural storage reservoirs and distributors of the water supply, and hold that it would be just as well to destroy them entirely. If this is ever done the lesson will be a most costly one, and will be learned too late to be of any avail.

Correspondence.

The Palm-house at Allegheny City Park.

To the Editor of Garden and Forest:

Sir.—The finest specimens of Banana plants I have ever seen are in the Palm-house connected with the park in this city. The house was finished in the fall of 1888; the Bananas were planted during the latter part of November. A group of *Musa Sapientum* has now six stems, two of which are maturing large bunches of fruit. The original stem has just been cut down after ripening a bunch of 100 perfect fruits. The stem, at two feet from the ground, is fourteen inches in diameter. The largest plant in the group is twenty-seven feet high, the smallest is twenty-one feet. The spread from outside to outside is twenty-five feet; the leaf-blades, independent of the petiole, are eight feet long and twenty-six inches wide, and altogether the effect of the group is magnificent. Specimens of *Musa Cavendishi* are ten feet high and as many in width, with leaves a yard wide. A bunch on one plant contains no less than 264 perfect fruits. Let me add that unless one has been fortunate enough to eat a banana that has ripened on the plant he has no idea of what a perfect banana is. There are groups, also, of *Musa rosacea* most beautiful in contour. The general effect of these groups are as tropical as possible. The plants are all set out in deep, rich soil, and are abundantly supplied with water at all seasons. Another plant bearing fruit very freely is the Lyre plant, *Philodendron pertusum* or *Monstera deliciosa*. This is rambling over the rock-work, and is a very characteristic piece of verdure. In the same house is a splendid specimen of *Cycas circinalis*, spreading eighteen feet and twelve feet in height. This plant, two months since, produced a perfect flower scape, and has now thirty-six new fronds nearly developed. *Ficus imperialis*, a plant with heart-shaped leaves, eighteen inches across, is seen in a specimen twelve feet high and of great beauty. *Dracæna fragrans* towers up twenty feet, and is well furnished to the ground. A *Pandanus reflexus*, probably the largest plant in the country, is standing on a pedestal three feet from the ground. The leaves touch the ground, and the extreme points are over ten feet high, and the spread of the plant is eight feet. Good examples of the Dove Orchid are in flower, bearing from three to seven spikes, with from twenty to thirty flowers on each.

The entire group of glass houses here were given to Allegheny City by Mr. H. Phipps, Jr., and are open to the public every day. Mr. W. Hamilton, the superintendent, informs me that as many as 2,000 persons visit the green-houses on Sunday alone.

J. Thorpe.

Allegheny City.

Helonias bullata.

To the Editor of Garden and Forest:

Sir.—A neighbor took me to see a "new plant" which had been found on his land this spring. It proved to be *Helonias bullata*. It is growing on the banks of a small mountain stream in the midst of a "Laurel thicket." There are, probably not more than a hundred plants in the lot, and what seems strange to me is that, although I have searched the same stream up and down for miles and all other like situations in this region, I can find no others.

The location is at an altitude of about 4,000 feet. It is near Short Off Mountain, in Macon County, North Carolina. Does any one know that this plant has been found in the Alleghany Mountains before?

Highlands, N. C. *Frank Boynton.*

Notes.

A cluster of grapes weighing five pounds was lately taken from a Vine of the Golden Chasselas variety in Contra Costa County, California.

One of the green-houses in the park of Allegheny City, 150 feet long by eighteen feet wide, is now being filled with Chrysanthemums for display in the late autumn.

Downing's Ever-bearing Mulberry produces ripe fruit for nearly four months in California. In the middle of September the trees were still filled with berries in all stages—from the blossoms to the ripe fruit.

About thirty papers have been promised for the meeting of the Forestry Congress in Philadelphia, and the prospect is fair not only for an entertaining session but for some practical treatment of the more important problems of forestry.

The white-flowered *Desmodium Japonicum*, which comes into bloom at this season just after the showy lilac blossoms of the *D. penduliflorum* have faded, is very beautiful just now and is a most valuable plant for its late blooming qualities.

The published statements that the Plum curculio has at last made its appearance in California are happily without foundation. It seems that Fuller's Rose beetle, which has been very destructive in Los Angeles County, on Evergreen Oaks, Camellias, Palms, etc., was mistaken for the Plum-weevil.

Gordonia pubescens has flowered this year at the Arnold Arboretum, growing in the open ground. The plant was bent over and covered with soil last winter. Though not hardy at Boston it might do well when trained against a sheltering wall. A few of its beautiful flowers would well repay a little trouble and care.

The large rosy fruit of the *Magnolia Umbrella* still makes that tree conspicuous as it has been for several weeks. This is one of the smaller of our native Magnolias, and its large tropical-looking leaves and creamy-white flowers in spring would make it a desirable tree for planting, even without the autumn beauty of its fruit.

The Eaton Grape was grown from seed of the Concord in 1869. The vine is vigorous, the clusters large, the berries nearly an inch in diameter, with a dense blue bloom. On the trial-grounds of the *Rural New Yorker* it ripens just before the Concord. It is juicy, but not of the highest quality. Mr. Carman considers it well worthy of general trial.

A correspondent of the London *Garden* makes the following judicious remarks on the subject of judging vegetables at exhibitions: "Some judges are apt to give weight to exhibits which are out of season, as, for instance, very late Asparagus, which should not have been cut, or very early Celery, which, useful enough for flavoring, would not be asked for as salad during summer weather. Really good products, presenting substantial crops in season, are much to be preferred."

A correspondent of Mr. Peter Henderson recently sent to him, from France, a cluster of grapes upon which some of the berries were green, some black, some half green and half black—the colors divided sharply by a meridian line—and some were striped green and black. This seems like another example of the influence of strange pollen. But a letter which accompanied the grapes stated that all the clusters were mottled in the same way, and had been every season since it began to bear, some nine years ago. The vine is a seedling of unknown parentage.

It is somewhat surprising that two such popular plants as the Dahlia and the Chrysanthemum should have been introduced to English gardens the same year—1789. The Dahlia Centennial has been celebrated with much gusto, and a grand show at the Crystal Palace, and the Chrysanthemum growers are making great preparations for a still more enthusiastic demonstration. A London correspondent writes that by the the middle of September the early Chrysanthemums were seen everywhere. The most popular of these early flowers were George Wermig, Madame Desgranges and Précocité—all good.

The September number of *Harpers' Magazine* contains some striking illustrations of forest-trees and forest-scenery in the California Coast Range. Two pictures of Cypresses at Monterey are especially good; one of them showing the habit and expression of the individual tree with its bare roots hooked about the rocks on the coast, and the other giving glimpses of the mystery and delicate beauty of an opening in the Cypress woods. The illustrations of the Fog among the Redwoods, the Scrub Oak and Chapparal are successful in catching the spirit of the scenery with much of its indefinable charm.

The committee appointed by the American Association of Nurserymen for the purpose of obtaining lower rates on express lines, have been successful in securing a new classification, under which a reduction of twenty to twenty-five per cent. will be saved on all express charges, on shipments of trees and shrubs, boxed or baled. Such packages are now classed with produce. This is good news to fruit growers, nurserymen and many others. Mr. S. M. Emery and his associates on the committee are to be congratulated upon their success. These organized efforts of the nurserymen have now brought about reduced freight, reduced postage and reduced express charges on nursery stock.

The *Gardeners' Chronicle*, after speaking of the fine display of color made at this season by *Crocosma aurea*, adds that the variety Imperialis, introduced by Mr. Max Leichtlin, is much finer than the type. The stems are three feet or more high, and the flowers are fully three inches across, with broad segments, and a deep orange, almost scarlet color. Some of the plants of this variety show a slight tendency to the spotting which is so conspicuous in that recently described by Mr. Baker as Maculata. The flowers are large, and the three inner segments of the corolla have each a broad band of purple a little distance from the base. These plants, with the Montbretias and the numerous progeny of the two so-called genera, are certain to be almost as popular as Daffodils when they become better known.

The Country Gentleman says that the meagre show of grapes at the New York State Fair brought into prominence an exhibit of the new white grape, Diamond, an entire two-year-old grafted vine with twenty clusters being shown. The grape originated with Jacob Moore, of Rochester, in 1880, from a cross of Iona on Concord. It ripens the last of August or first of September, before the Delaware or Niagara; is of medium size in bunch and berry; pulp tender to the centre and of pure vinous, with a trace of the Iona, flavor; seeds, small. The foliage is said to be strong and healthy; certainly the speciman vine, taken up August 21st, showed well-ripened wood. The name of Mr. Moore, the originator of the Brighton, is a guarantee of a good grape, and from what we have seen of it, the Diamond is the most promising white grape in the market. It is said to keep well and to make a good raisin, characteristics not unusual in choice early grapes, like the Eumelan for instance.

An interesting account of the manufacture of "Buhach," the trade name of a well-known insect-powder produced from the flowers of *Pyrethrum cinerariæfolium* is printed in a recent issue of the *Pacific Rural Press*. This plant, a native of Dalmatia, is the source of the Dalmatian insect-powder, a well-known article of commerce for the past thirty years. Trieste, from which it is shipped all over the world, is the principal market for this product, but California is likely to become a serious rival for the trade. The plant was first introduced into California twelve years ago by Mr. G. N. Milco, a native of Dalmatia. From a small beginning the business of growing the Pyrethrum has been gradually extended. About 300 acres near Atwater, in Merced County, are now devoted to its cultivation, the product being sold all over the United States as "Buhach." The successful cultivation of the plant requires care and constant supervision. The fields are irrigated, and three years from the sowing of the seed are necessary before a paying crop of flowers is produced. The plants continue to produce crops of flowers during several years, although they are most productive at the age of four or five years. "It grows to a height of about thirty inches, and is planted in rows four feet apart and from fifteen to twenty-four inches apart in the row. The flowers are generally harvested in the latter part of May. The stalks are cut at the roots of the plant, and then by the hand the flowers are broken off by passing the stems through a sort of comb, which detaches the flowers, and they fall into a box and are then carried to the drying-ground, where they are spread upon sheets and exposed to the rays of the sun. During the day they are often turned, and at night they are covered to prevent them from absorbing any moisture. The perfect drying of the flowers is a most important operation, as, in order to retain the volatile oil which gives to the powder its insect-destroying properties, it is very necessary that the flowers should be dried quickly and thoroughly, and be protected during the process from all moisture. A light dew falling upon the flowers during the drying process will color them and reduce their value as an insecticide. In this respect the California-grown flowers are better cured and consequently more valuable than those grown in Dalmatia."